

REMARKS

Claims 32-57 are pending in the application with claim 49 amended herein and new claims 56 and 57 added herein.

Claim 49 stands rejected under 35 U.S.C. 112, second paragraph as being indefinite. Applicants request reconsideration.

Claim 49 is amended herein to state that the encapsulant and support material of claim 33 together encapsulate more of the individual lengths of the plurality of fibers than just one end. Page 2 of the Office Action states that it is unclear how the fibers can be encapsulated "beyond one end." Without admitting to the propriety of the indefiniteness rejection, Applicants removed the allegedly offending terms so that claim 49 sets forth encapsulating more than just one end of the fiber lengths. That is, the encapsulant and support material do not merely encapsulate one end of fibers, rather, they encapsulate more than just one end. In Fig. 2 of the present specification, the support material and encapsulant extend upward to encapsulate more than just one end of the fibers. Fig. 2 may be contrasted with Koon '548 that merely provides in column 6, line 13 and elsewhere that fibers are attached "by a first end." Koon '548 does not describe encapsulating more than just one end of fibers.

Applicants note that the indefiniteness rejection on page 2 of the Office Action appears to be cut short and/or missing some text. Accordingly, Applicants herein endeavored to advance prosecution in light of text that is present. If the Office intended to make additional remarks regarding indefiniteness, then Applicants request correction of the indefiniteness rejection in the next Office Action. Nevertheless,

Applicants assert that claim 49 is definite and request withdrawal of the indefiniteness rejection in the next Office Action.

Claims 32-48 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koon '548 in view of Koon '707. Applicants request reconsideration.

Page 2 of the Office Action incorporates the grounds for rejection set forth in prior office actions. Accordingly, Applicants herein reiterate the remarks made in the previous preliminary amendments that accompanied the RCE filed July 19, 2002 and further assert the remarks below in response to the Response to Arguments on pages 4-6 of the present Office Action. By virtue of the remarks incorporated by reference and the additional remarks herein, the present document constitutes a response to every ground of rejection.

Claim 32 sets forth a thermal interface that includes, among other features, an encapsulant and a plurality of thermally conductive fibers forming a thermally conductive composite. An average length of the fibers is greater than an average thickness of the encapsulant along an average direction of the fiber lengths. The Office previously alleged that Koon '548 teaches a portion of fiber length embedded in adhesive wherein heat transfer occurs through the exposed portion of the fiber lengths contacting air flow. Page 5 of the Office Action confirms that Koon '707 is relied upon as suggesting modification of Koon '548 by adding encapsulant. The motivation relied upon by the Office to suggest such modification is the teaching of Koon '707 "to enhance a conductive pathway between a heat-producing material and a heat-dissipating material by providing a higher conductivity than air circulating around flocked fibers." (Office Action, page 5.) Even so, the Office previously acknowledged that neither of the Koon references teach the present limitation of an average fiber length greater than an average encapsulant thickness.

Instead, the Office alleges that combination of the references inherently teaches such limitation. Applicants traverse the rejection for the reasons herein incorporated by reference as well as for the additional following reasons.

Initially, the Office bears the burden of factually supporting any conclusion of obviousness. The Applicants need not submit any evidence of non-obviousness until the Office produces a prima facie case that the claims are obvious. Three basic criteria are required to establish a prima facie case. First, the prior art must suggest to those of ordinary skill in the art, "that they should make the claimed composition or device, or carry out the claimed process." In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). Second, the prior art must reveal "that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success." Id. Third, all of the claimed limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580, 582-3 (CCPA 1974). Applicants assert that the Office has not established a prima facie case because the cited combination fails to satisfy at least the first and third criteria.

As to the first criterion, obviousness can be established by a combination of references, but not unless there is some motivation in the art to support the combination. The motivation for forming the combination must be something other than hindsight reconstruction based on using Applicants' invention as a road map for such combination. See, e.g., Interconnect Planning Corp. v. Veil, 227 USPQ 543, 551 (Fed. Cir. 1985); In re Mills, 16 USPQ2d 1430 (Fed. Cir. 1990) (explaining that hindsight reconstruction is an improper basis for rejection of a claim). Also, the mere fact that the prior art can be modified does not make the modification obvious "unless the prior art suggested the

desirability of the modification." In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Page 5 of the previous April 19, 2002 Office Action acknowledges that "neither of the Koon references teach the present limitation of an average fiber length greater than an average encapsulant thickness." Thus, the Office modified Koon '548 by adding an encapsulant to the flocked fiber heat transfer structure of Koon '548. The suggestion in the art for the desirability of the modification is the alleged expectation in Koon '707 "of increasing the productivity of said heat transfer structure" by enhancing a conductive pathway between the heat-producing material and an added heat-dissipating material. (Office Action, page 5.) Since Koon '707 uses an encapsulant in combination with flocked fibers, the Office argues that those of ordinary skill would expect the Koon '707 productivity increase by adding encapsulant to Koon '548.

However, Applicants assert that the first criterion of a prima facie case requires that the prior art suggest making the claimed device. Merely adding encapsulant to Koon '548 does not modify Koon '548 in a manner that produces the claimed device. Some additional teaching or suggestion must exist to add an appropriate amount of encapsulant such that the average length of the fibers is greater than an average thickness of the encapsulant along an average direction of the fiber lengths, as claimed. Koon '548 does not provide even a mention of encapsulant and cannot be relied upon for the required teaching or suggestion. As acknowledged by the Office, Koon '707 also does not disclose or suggest the claimed relationship between encapsulant thickness and fiber length.

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. MPEP § 2141.02 citing W.L.

Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). The relied upon suggestion in Koon '707 "of increasing the productivity of said heat transfer structure" is only disclosed in Koon '707 as being achieved by fiber flocking opposing surfaces separately, interdigitating the fibers of a first surface with the fibers of a second surface, and applying a polymer material. If a person of ordinary skill desired to increase the productivity of the Koon '548 heat transfer structure, then the clear suggestion by Koon '707 is to fiber flock a heat-dissipating material, interdigitating the fibers of the heat-dissipating material with the Koon '548 flocked fibers, and apply a polymer material.

The suggestion alleged by the Office to come from Koon '707 of merely adding encapsulant actually departs from the express teachings of Koon '707. The express text of Koon '707 does not provide any expectation whenever "of increasing the productivity of said heat transfer structure" in Koon '548 by merely adding encapsulant. That is, when Koon '707 is properly considered in its entirety, as is required, the only suggestion that may be attributed to Koon '707 is to fiber flock a heat-dissipating material and to interdigitate its fibers with the Koon '548 fibers. The Office's conclusion that Koon '707 suggests doing so much less than it expressly discloses as suitable constitutes improper piecemeal application of the reference. Accordingly, Applicants assert that the only identifiable source for a suggestion of the claim 32 relationship between encapsulant thickness and fiber length is the Applicants' own specification. Thus, the Office's conclusion constitutes improper hindsight reconstruction.

Page 5 of the Office Action states that "the length of the flocked fibers of Koon '707 vs. the thickness of the encapsulant is irrelevant to the standing rejection." Such

statement confirms the failure of the Office to properly consider Koon '707 in its entirety. As described in column 5, lines 27-50 of Koon '707, the encapsulant is intentionally more thick than the fiber length. In the context of Koon '707, it is expressly "the length of the flocked fibers of Koon '707 vs. the thickness of the encapsulant" that provides the relied upon increase in productivity and enables heat transfer from a heat-producing material to a heat-dissipating material through the interdigitated fibers. Absent such supposedly "irrelevant" subject matter, Koon '707 would fail to achieve the relied upon increase in productivity.

The device of claim 32 is thus clearly distinguished from the only teachings in the art regarding a relationship between fiber length and encapsulant thickness since claim 32 sets forth a fiber length greater than the encapsulant thickness (the opposite of Koon '707). Applicants acknowledge that the Office does not wish to rely upon the teachings in Koon '707 of fiber length vs. encapsulant thickness. However, the Office must consider the reference in its entirety, including portions that would lead away from the claimed invention. The Office cannot choose to rely upon the result of Koon '707 (increased productivity) while ignoring the structural features that produce the result.

At least for the reasons described above, the cited combination of references fails to suggest to those of ordinary skill in the art that they should make the claimed device and fails to satisfy the first criterion of a prima facie case. The cited art does not suggest the desirability of a modification that produces the claimed device. Considering Koon '707 in its entirety, as required, clearly leads those of ordinary skill away from the claimed invention. Further, interdigitating flocked fibers of a heat-dissipating material with the Koon '548 flocked fibers and applying a polymer material fully addresses the Office's relied

upon motivation "of increasing the productivity" of the Koon '548 heat transfer structure without producing the claimed device.

As to the third criterion, all of the claimed limitations must be taught or suggested by the prior art. Applicants acknowledge, but traverse, the position on page 5 of the Office Action that applying encapsulant to the Koon '548 heat transfer structure produces the claimed device since the encapsulant will inherently shrink upon curing, leaving fiber tips exposed above the encapsulant. "The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency." In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (citations omitted) (emphasis in original); MPEP § 2112. "In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis added); MPEP § 2112.

As established above by the Applicants, the cited references do not disclose or suggest the thermal interface of claim 32 with an average length of fibers greater than an average thickness of encapsulant. Such a feature does not necessarily result merely by combining encapsulant with the heat transfer structure of Koon '548. It is just as likely that the encapsulant could be applied with enough to thickness that even conventional shrinkage is not enough to expose fiber tips. Perhaps it is possible for a randomly selected thickness to result in exposure of fiber tips upon shrinkage of encapsulant. However, such circumstance is not sufficient to establish inherency. Neither of the cited references provide any suggestion or motivation to expose fiber tips after applying

encapsulant. Also, neither of the cited references teach using a thickness that will inherently expose fiber tips. Accordingly, it is improper to conclude that any encapsulant applied to the heat transfer structure of Koon '548 will always result in exposure of fiber tips upon shrinkage. For at least for such reason, the thermal interface of claim 32 does not inherently result from the teachings of Koon '548 in view of Koon '707.

In view of Applicants' assertions herein, claim 32 is patentable over the cited combination. Claims 33 and 34 depend from claim 32 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested. The remarks incorporated herein by reference discuss the subject matter of claims 35-48. Claims 35-48 set forth as independent claims, or by virtue of their dependency, a relationship between fiber length (and/or fiber tips) and encapsulant (and/or support material or adhesive) thickness. Applicants assert that the cited references, considered alone or in combination, do not disclose or suggest the subject matter of claims 35-48. The assertions above regarding the deficiencies of the cited references with regard to claim 32 also apply by analogy to claims 35-48. At least for such reasons, claims 32-48 are patentable over Koon '548 in view of Koon '707. Applicants request allowance of such claims in the next Office Action.

Claims 49 and 50 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koon '548 in view of Koon '707. Claims 49 and 50 depend from claim 33, which depends from claim 32, and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested. Applicants request allowance of claims 49 and 50 in the next Office Action.

Claims 51, 52, and 54 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koon '548 in view of Koon '707 and in further view of Distefano and Gilleo. Applicants request reconsideration. Claims 51, 52, and 54 depend from claim 32 or claim 48 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested. For example, such claims set forth that the encapsulant comprises a gel or a polymeric gel. Even if Distefano and Gilleo may be considered to teach, as alleged, that silicone elastomers and silicone gels are equivalent encapsulants, such teaching does not necessarily apply to the inventions of claims 51, 52, and 54. Applicants assert that Distefano and Gilleo do not contain any reference to conductive fibers. Applying an encapsulant material to the structures of Distefano and Gilleo may be an entirely different matter from applying the encapsulant material to conductive fibers. Those of ordinary skill would not expect silicone gels to work in the conductive fiber context just because they work in the context of Distefano and Gilleo. Applicants request allowance of claims 51, 52, and 54 in the next Office Action.

Claims 53 and 55 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koon '548 in view of Koon '707. Claims 53 and 55 depend respectively from claims 35 and 48 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested. Applicants request allowance of claims 53 and 55 in the next Office Action.

New claims 56 and 57 are presented herein as containing substantially the same subject matter as claims 53 and 55 except that the term "if any" is removed in claims 56 and 57. As stated on page 4 of the Office Action, the prior art does not teach or suggest


the subject matter now set forth in claims 56 and 57. Applicants request allowance of claims 56 and 57 in the next Office Action.

Applicants herein establish patentability of claims 32-57 over all cited references at least for the reasons described herein. Accordingly, Applicants request allowance of all pending claims 32-57 in the next Office Action.

Further, Applicant herewith submits a duplicate copy of the Information Disclosure Statements and Form PTO-1449 filed in this application on November 16, 2001, July 19, 2002, and August 9, 2002. No initialed copy of the PTO-1449 has been received back from the Examiner. To the extent that the submitted references listed on the Form PTO-1449 have not already been considered, and the Form PTO-1449 has not been initialed with a copy being returned to Applicant, such examination and initialing is requested at this time, as well as return of a copy of the initialed Form PTO-1449 to the undersigned.

Respectfully submitted,

Dated: 02 Jan 2003

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Application Serial No. 09/333,564
 Filing Date June 21, 1999
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 Attorney's Docket No. JM34806US
 Title: Compliant Fibrous Thermal Interface

VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING
RESPONSE TO OCTOBER 3, 2002 OFFICE ACTION

In the Claims

The claims have been amended as follows. Underlines indicate insertions and ~~strikeouts~~ indicate deletions.

49. (twice amended) The interface of claim 33 wherein the encapsulant and support material together encapsulate ~~fibers beyond one end~~ more of the individual lengths of the plurality of fibers than just one end.

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